

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 10 August 2000 (10.08.00)	
International application No. PCT/GB99/04232	Applicant's or agent's file reference DUNW/P22221PC
International filing date (day/month/year) 14 December 1999 (14.12.99)	Priority date (day/month/year) 14 December 1998 (14.12.98)
Applicant COHEN, Philip et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
07 July 2000 (07.07.00)

☐ in a notice effecting later election filed with the International Bureau on:  
\_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	Authorized officer  Zakaria EL KHODARY  Telephone No.: (41-22) 338.83.38
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REC'D 26 FEB 2001

WIPO

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## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DUNY / P22221PC	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/04232	International filing date (day/month/year) 14/12/1999	Priority date (day/month/year) 14/12/1998
International Patent Classification (IPC) or national classification and IPC C07K14/435		
Applicant THE UNIVERSITY OF DUNDEE et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"><li>I <input checked="" type="checkbox"/> Basis of the report</li><li>II <input type="checkbox"/> Priority</li><li>III <input checked="" type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li><li>IV <input type="checkbox"/> Lack of unity of invention</li><li>V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li><li>VI <input type="checkbox"/> Certain documents cited</li><li>VII <input type="checkbox"/> Certain defects in the international application</li><li>VIII <input type="checkbox"/> Certain observations on the international application</li></ul>		
Date of submission of the demand  07/07/2000	Date of completion of this report  22.02.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Ury, A  Telephone No. +49 89 2399 8411 	

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/04232

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).):*

### Description, pages:

1-100 as originally filed

### Claims, No.:

1-44 as originally filed

### Drawings, sheets:

1/20-20/20 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/04232

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

### III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 11-27, 29-31, 36-39, 44.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 11-27, 29-31, 36-39, 44.

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

### V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Yes: Claims 3-10, 32-35

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04232

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	No:	Claims	1, 2
Inventive step (IS)	Yes:	Claims	3-10, 32-35
	No:	Claims	1, 2, 41
Industrial applicability (IA)	Yes:	Claims	1-10, 32-35, 41
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB99/04232

1. If the priority right could not be acknowledged, then Biochem. J., 1999, 344, 189- 197 (D1) and Biochem. J., 1999, 339, 319-328 (D2) would be detrimental to the present claims.
2. At least 2 inventive concepts (Rule 13 PCT) can be seen in the present application:
  - a) claims 1-10, 28, 32-35, 41 are related to the activation/deactivation of sgk by phosphorylation/dephosphorylation,
  - b) claims 11-27, 29-31, 44 have nothing to do with the activation/deactivation but are only related to sgk per se.Claims 36-40 and 42 cannot be precisely related to any of the above mentioned inventive concepts.
3. Claims 40, 42 and 43 are methods of treatment of the human body and could give rise to objections under certain patent laws.
4. Pflügers Arch-Eur. J. Physiol., 1998, 436, 575-580 (D3) describes the cloning of sgk from shark rectal gland, which is, according to Fig.2 and page 578 (left column), phosphorylated on a tyrosine residue present within the ATP binding domain.  
Therefore, claims 1, 2 cannot be considered as novel (Article 33.2 PCT). Claims 25, 37 and 41 are not inventive (Article 33.3 PCT), since they only imply the knowledge of at least one biological activity of said sgk and indeed the name "sgk2" itself describes such a biological activity.
5. Basically claims 25, 26, 31, 37 cannot be novel over the most basic knowledge of the skilled man, since they embrace substances such as urea or guanidinium chloride (Article 33.2 PCT).
6. A "...fragment..." as mentioned in claims 11, 14 for instance, without any structural or functional characterization cannot be accepted under Articles 6 and 33.2 PCT, since such a term also embraces any single amino acid. This also implies that the claims relating to the corresponding polynucleotides, such as claims 18 and 19 are also not allowable under Articles 6 and 33.2 PCT, since they embrace an isolated codon and may hence lead to the patenting of the genetic code.

- 7.1** **sgk has been characterized in Molecular and Cellular Biology, 1993, 13/4, 2031-2040 (D4)** as a threonine/serine protein kinase and shown to share about 50% homology with other kinases such as rac protein kinase, protein kinase C, ribosomal protein S6 kinase and cAMP dependent protein kinase.
- 7.2** **Human sgk has been cloned as demonstrated in PNAS, 1997, 94, 4440-4445 (D5)** and the same homology as in D4 has also been reported in D5. It would have been obvious for the skilled man to make fusion polypeptides containing part of the human sgk and/or to make the corresponding polynucleotide sequences as well as transformed host cells. Therefore, claims 11-13, 18-21, 24 are not inventive (Article 33.3 PCT). The same apply to claims 25, 26, 29, 30, 37-39 which only correspond to the use of the biological activity of said sgk which was already suggested by the name itself.
- 7.3** **D4** indicates on page 2039 (left column) that the protein kinases are primarily regulated by phosphorylation.
- On the other hand, several documents (Current Biology, 1997, 8, 69-81 (D6), Current Biology, 1998, 8, 1366-1375 (D7), Science, 1998, 281, 2042-2045 (D8), Current Biology, 1997, 7, 776-789 (D8)** demonstrate that protein kinase C, protein kinase B and/or p70 S6 kinase, which share about 50% homology with sgk, are phosphorylated by PDK1.
- It could therefore be concluded that the skilled man would have expected said PDK1 to phosphorylate sgk, so that the whole application, as far as it is concerned with the phosphorylation, lacks an inventive step (Article 33.3 PCT).
- However, the prior art appears to be a little more complicated and seems to teach away from this conclusion. Indeed, D5 indicates on page 4444 (right column) that sgk appears to belong to a new family of protein kinases which are "...predominantly regulated at the transcriptional level by hormone- or mitogen-induced pathways...".
- It must then be concluded that the situation for the skilled man at the priority date of the present application was not clear as far as the sgk activation process was concerned. Phosphorylation may have been one possibility, as was also a hormone/mitogen regulation.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB99/04232

Therefore, the skilled man would not have considered for sure that activation is related to phosphorylation and the subject-matter of the present application, as far as the phosphorylation is concerned, must be considered as novel (Article 33.2 PCT) and inventive (Article 33.3 PCT).



## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>DUNW / P22221PC</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/GB 99/ 04232</b>	International filing date (day/month/year) <b>14/12/1999</b>	(Earliest) Priority Date (day/month/year) <b>14/12/1998</b>
Applicant <b>THE UNIVERSITY OF DUNDEE et al.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 5 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

**1. Basis of the report**

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☒ **Unity of invention is lacking** (see Box II).

**4. With regard to the title,**

the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

**5. With regard to the abstract,**

the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

1



None of the figures.

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

SEE ADDITIONAL SHEET

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-10, 28, 32-35, 40-43

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,28,32-35,40-43

These claims form an inventive concept, as far as they are related to the activation/deactivation of sgk by phosphorylation.

On the contrary, claims 11-27,29-31,44 have nothing to do with the activation or phosphorylation of sgk, but are only concerned with sgk itself. They form another inventive concept not directly related to the previous one and hence contravene the provisions of Rule 13 PCT.

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04232

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/435 C12P21/02 C12N9/12 C12N15/54 C12N15/63

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	S. WALDEGGER ET AL.: "Cloning of sgk serine/threonine protein kinase form shark rectal gland- a gene induced by hypertonicity and secretatogues" PFLÜGERS ARCH.-EUR. J. PHYSIOL., vol. 436, 1998, pages 575-580, XP002133634 the whole document	1-10,28, 32-35, 40-43
P,X	--- T. KOBAYASHI ET AL.: "Characterization of the structure and regulation of two novel isoforms of serum- and glucocorticoid-induced protein kinase" BIOCHEM. J., vol. 344, 1999, pages 189-197, XP000881885 the whole document --- -/--	1-10,28, 32-35, 40-43

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

24 May 2000

Date of mailing of the international search report

31.05.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Marie, A

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 99/04232

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>T. KOBAYASHI ET AL.: "Activation of serum and glucocorticoid regulated protein kinase by agonists that activate phosphatidylinositide 3-kinase is mediated by 3-phosphoinositide dependent protein kinase-1 (PDK1) and PDK2"</p> <p>BIOCHEM. J., vol. 339, 1999, pages 319-328, XP000881886 the whole document</p> <p>-----</p>	<p>1-10,28, 32-35, 40-43</p>

# INTERNATIONAL SEARCH REPORT

Intern. Application No.  
PCT/GB 99/04232

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/435 C12P21/02 C12N9/12 C12N15/54 C12N15/63

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

24 May 2000

Date of mailing of the international search report

31.05.00

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Marie, A

## INTERNATIONAL SEARCH REPORT

Intern. Application No.  
PCT/GB 99/04232

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# INTERNATIONAL SEARCH REPORT

Int. application No.  
PCT/GB 99/04232

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

SEE ADDITIONAL SHEET

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
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Remark on Protest

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**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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These claims form an inventive concept, as far as they are related to the activation/deactivation of sgk by phosphorylation.

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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

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Applicant  <b>THE UNIVERSITY OF DUNDEE et al.</b>		

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6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1  
☐ None of the figures.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB 99/04232

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

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## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

SEE ADDITIONAL SHEET

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-10, 28, 32-35, 40-43

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-10,28,32-35,40-43

These claims form an inventive concept, as far as they are related to the activation/deactivation of sgk by phosphorylation.

On the contrary, claims 11-27,29-31,44 have nothing to do with the activation or phosphorylation of sgk, but are only concerned with sgk itself. They form another inventive concept not directly related to the previous one and hence contravene the provisions of Rule 13 PCT.

## INTERNATIONAL SEARCH REPORT

International Application No.

PC 99/04232

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/435 C12P21/02 C12N9/12 C12N15/54 C12N15/63

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12P C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	S. WALDEGGER ET AL.: "Cloning of sgk serine/threonine protein kinase from shark rectal gland- a gene induced by hypertonicity and secretatogues" PFLÜGERS ARCH.-EUR. J. PHYSIOL., vol. 436, 1998, pages 575-580, XP002133634 the whole document	1-10,28, 32-35, 40-43
P,X	T. KOBAYASHI ET AL.: "Characterization of the structure and regulation of two novel isoforms of serum- and glucocorticoid-induced protein kinase" BIOCHEM. J., vol. 344, 1999, pages 189-197, XP000881885 the whole document	1-10,28, 32-35, 40-43

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

24 May 2000

Date of mailing of the international search report

31.05.00

Name and mailing address of the ISA

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Marie, A

## INTERNATIONAL SEARCH REPORT

International Application No.

PC 99/04232

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>T. KOBAYASHI ET AL.: "Activation of serum and glucocorticoid regulated protein kinase by agonists that activate phosphatidylinositide 3-kinase is mediated by 3-phosphoinositide dependent protein kinase-1 (PDK1) and PDK2"</p> <p>BIOCHEM. J., vol. 339, 1999, pages 319-328, XP000881886 the whole document</p> <p>-----</p>	<p>1-10,28, 32-35, 40-43</p>

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference DUNY / P22221PC	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB99/04232	International filing date (day/month/year) 14/12/1999	Priority date (day/month/year) 14/12/1998
International Patent Classification (IPC) or national classification and IPC C07K14/435		
Applicant THE UNIVERSITY OF DUNDEE et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 7 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  07/07/2000	Date of completion of this report  22.02.2001
Name and mailing address of the international preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer  Ury, A  Telephone No. +49 89 2399 8411 

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04232

**I. Basis of the report**

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

**Description, pages:**

1-100 as originally filed

**Claims, No.:**

1-44 as originally filed

**Drawings, sheets:**

1/20-20/20 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04232

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.  
☒ claims Nos. 11-27, 29-31, 36-39, 44.

because:

- ☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):
- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
- ☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.
- ☒ no international search report has been established for the said claims Nos. 11-27, 29-31, 36-39, 44.

2. A meaningful international preliminary examination report cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

- ☐ the written form has not been furnished or does not comply with the standard.  
☐ the computer readable form has not been furnished or does not comply with the standard.

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N) Yes: Claims 3-10, 32-35

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/GB99/04232

	No:	Claims	1, 2
Inventive step (IS)	Yes:	Claims	3-10, 32-35
	No:	Claims	1, 2, 41
Industrial applicability (IA)	Yes:	Claims	1-10, 32-35, 41
	No:	Claims	

2. Citations and explanations  
**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB99/04232

1. If the priority right could not be acknowledged, then **Biochem. J., 1999, 344, 189- 197 (D1)** and **Biochem. J., 1999, 339, 319-328 (D2)** would be detrimental to the present claims.
2. At least 2 inventive concepts (Rule 13 PCT) can be seen in the present application:
  - a) claims 1-10, 28, 32-35, 41 are related to the activation/deactivation of sgk by phosphorylation/dephosphorylation,
  - b) claims 11-27, 29-31, 44 have nothing to do with the activation/deactivation but are only related to sgk per se.Claims 36-40 and 42 cannot be precisely related to any of the above mentioned inventive concepts.
3. Claims 40, 42 and 43 are methods of treatment of the human body and could give rise to objections under certain patent laws.
4. **Pflügers Arch-Eur. J. Physiol., 1998, 436, 575-580 (D3)** describes the cloning of sgk from shark rectal gland, which is, according to Fig.2 and page 578 (left column), phosphorylated on a tyrosine residue present within the ATP binding domain.  
Therefore, claims 1, 2 cannot be considered as novel (Article 33.2 PCT). Claims 25, 37 and 41 are not inventive (Article 33.3 PCT), since they only imply the knowledge of at least one biological activity of said sgk and indeed the name "sgk2" itself describes such a biological activity.
5. Basically claims 25, 26, 31, 37 cannot be novel over the most basic knowledge of the skilled man, since they embrace substances such as urea or guanidinium chloride (Article 33.2 PCT).
6. A "...fragment..." as mentioned in claims 11, 14 for instance, without any structural or functional characterization cannot be accepted under Articles 6 and 33.2 PCT, since such a term also embraces any single amino acid. This also implies that the claims relating to the corresponding polynucleotides, such as claims 18 and 19 are also not allowable under Articles 6 and 33.2 PCT, since they embrace an isolated codon and may hence lead to the patenting of the genetic code.

- 7.1** **sgk has been characterized in Molecular and Cellular Biology, 1993, 13/4, 2031-2040 (D4)** as a threonine/serine protein kinase and shown to share about 50% homology with other kinases such as rac protein kinase, protein kinase C, ribosomal protein S6 kinase and cAMP dependent protein kinase.
- 7.2** **Human sgk has been cloned as demonstrated in PNAS, 1997, 94, 4440-4445 (D5)** and the same homology as in D4 has also been reported in D5. It would have been obvious for the skilled man to make fusion polypeptides containing part of the human sgk and/or to make the corresponding polynucleotide sequences as well as transformed host cells. Therefore, claims 11-13, 18-21, 24 are not inventive (Article 33.3 PCT). The same apply to claims 25, 26, 29, 30, 37-39 which only correspond to the use of the biological activity of said sgk which was already suggested by the name itself.
- 7.3** **D4** indicates on page 2039 (left column) that the protein kinases are primarily regulated by phosphorylation.  
**On the other hand, several documents (Current Biology, 1997, 8, 69-81 (D6), Current Biology, 1998, 8, 1366-1375 (D7), Science, 1998, 281, 2042-2045 (D8), Current Biology, 1997, 7, 776-789 (D8)** demonstrate that protein kinase C, protein kinase B and/or p70 S6 kinase, which share about 50% homology with sgk, are phosphorylated by PDK1.  
It could therefore be concluded that the skilled man would have expected said PDK1 to phosphorylate sgk, so that the whole application, as far as it is concerned with the phosphorylation, lacks an inventive step (Article 33.3 PCT).  
However, the prior art appears to be a little more complicated and seems to teach away from this conclusion. Indeed, D5 indicates on page 4444 (right column) that sgk appears to belong to a new family of protein kinases which are "...predominantly regulated at the transcriptional level by hormone- or mitogen-induced pathways...".  
It must then be concluded that the situation for the skilled man at the priority date of the present application was not clear as far as the sgk activation process was concerned. Phosphorylation may have been one possibility, as was also a hormone/mitogen regulation.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB99/04232

Therefore, the skilled man would not have considered for sure that activation is related to phosphorylation and the subject-matter of the present application, as far as the phosphorylation is concerned, must be considered as novel (Article 33.2 PCT) and inventive (Article 33.3 PCT).